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Küpper

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[54] **VERTICALLY ADJUSTABLE DRAWING FRAME**

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[30] **Foreign Application Priority Data**

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[51] **Int. Cl.**[4] **B65H 54/80**; D01H 5/00; F16M 11/26

[52] **U.S. Cl.** ..... **19/159 R**

[58] **Field of Search** ..... 19/159 R; 38/102.8; 223/68

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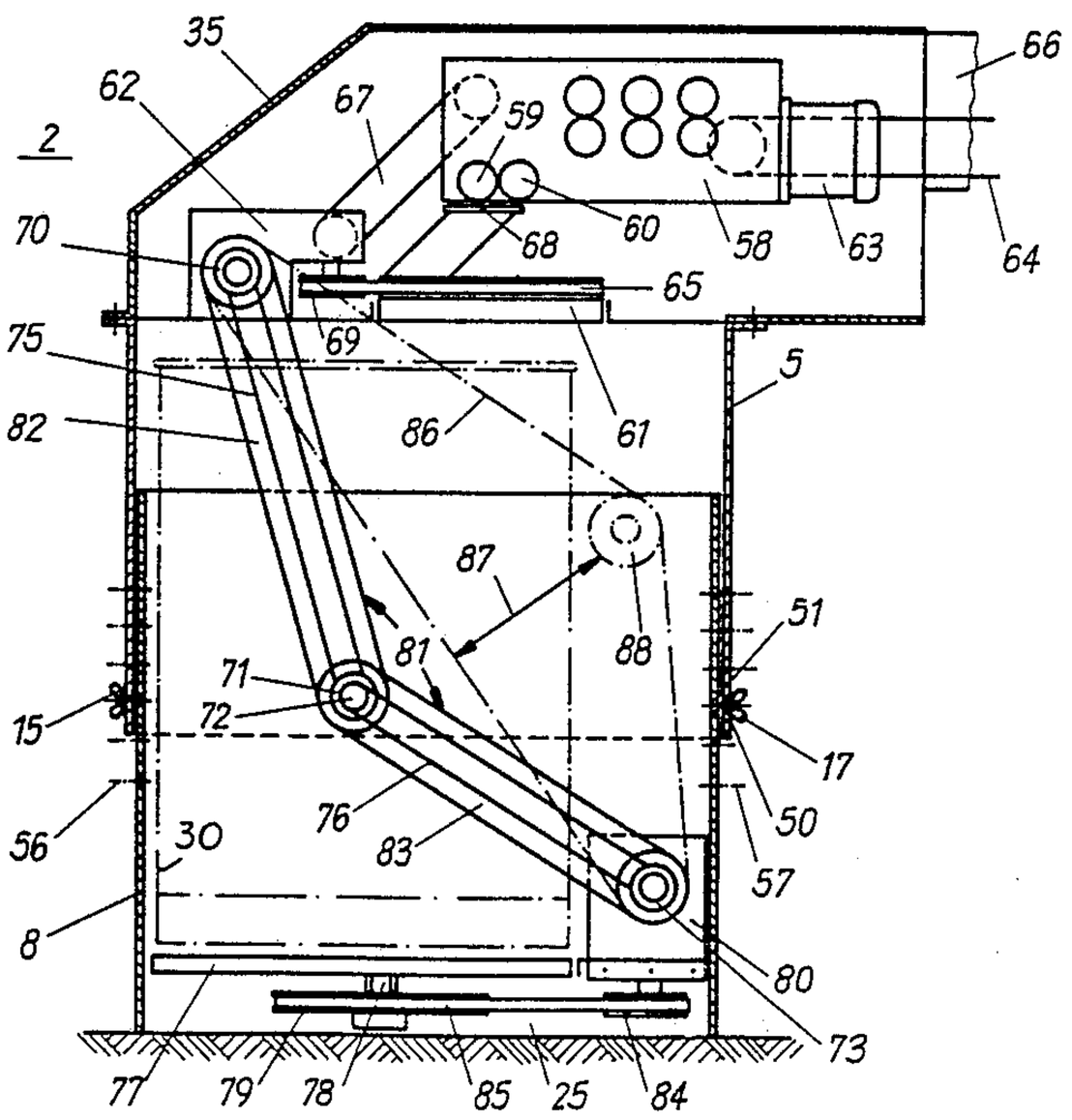
[57] **ABSTRACT**

A drawing frame has a housing having an upper part and a lower part telescoping therewith, attachments for securing the parts together at any of a plurality of different vertically offset positions, a turntable in the lower part for supporting a sliver can and for rotating it about an upright axis, and an intake device in the upper part for pulling in and drawing slivers and for depositing the drawn slivers in the can. One of the parts is at least partially within the other part and the one part is formed with a plurality of vertically offset holes. The attachments are bolts engagable through the other part with the holes of the one part. These attachment bolts can simply snap in place, or can actually be screwed into threaded holes in the inner part.

7 Claims, 3 Drawing Sheets



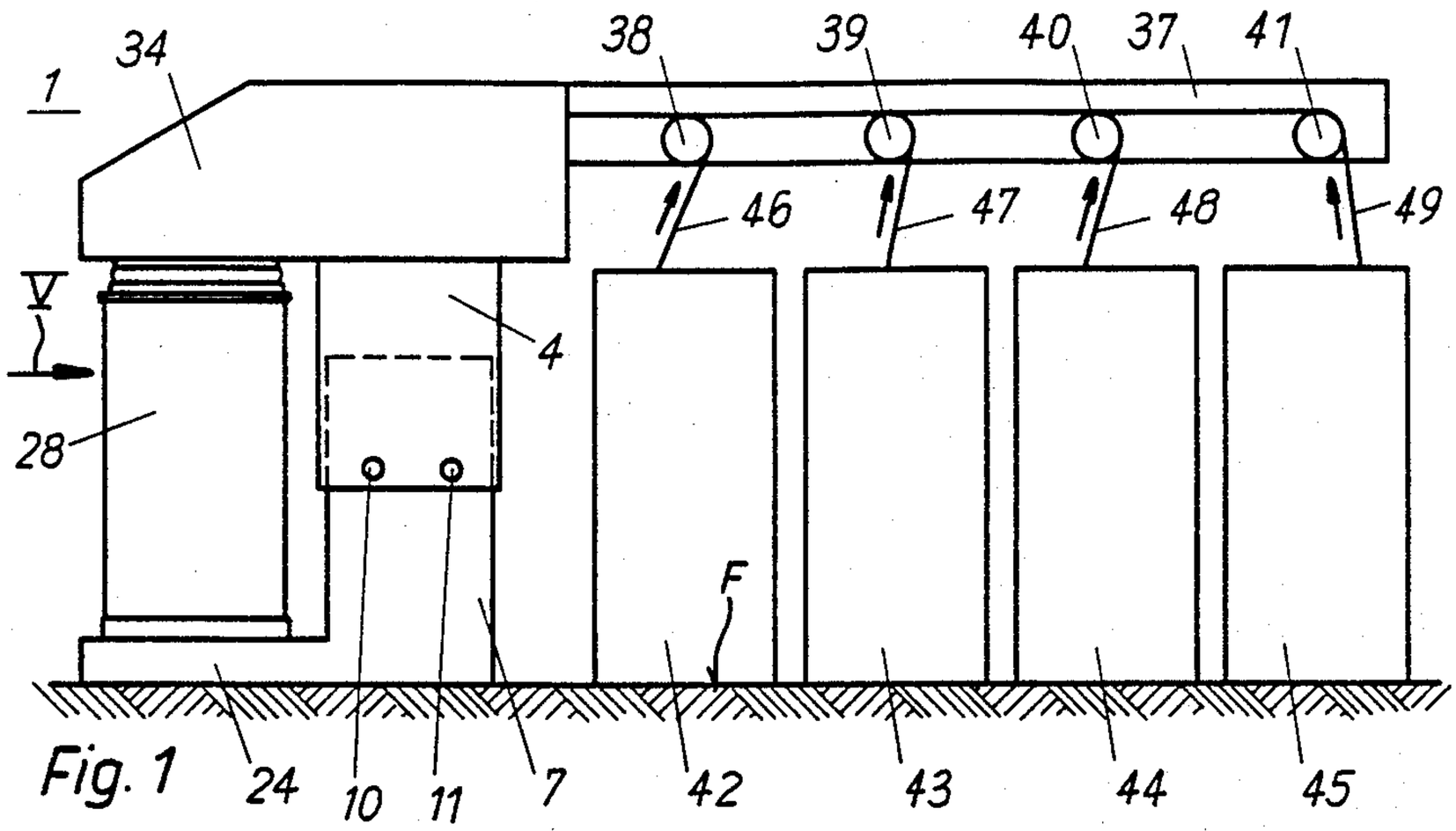


Fig. 1

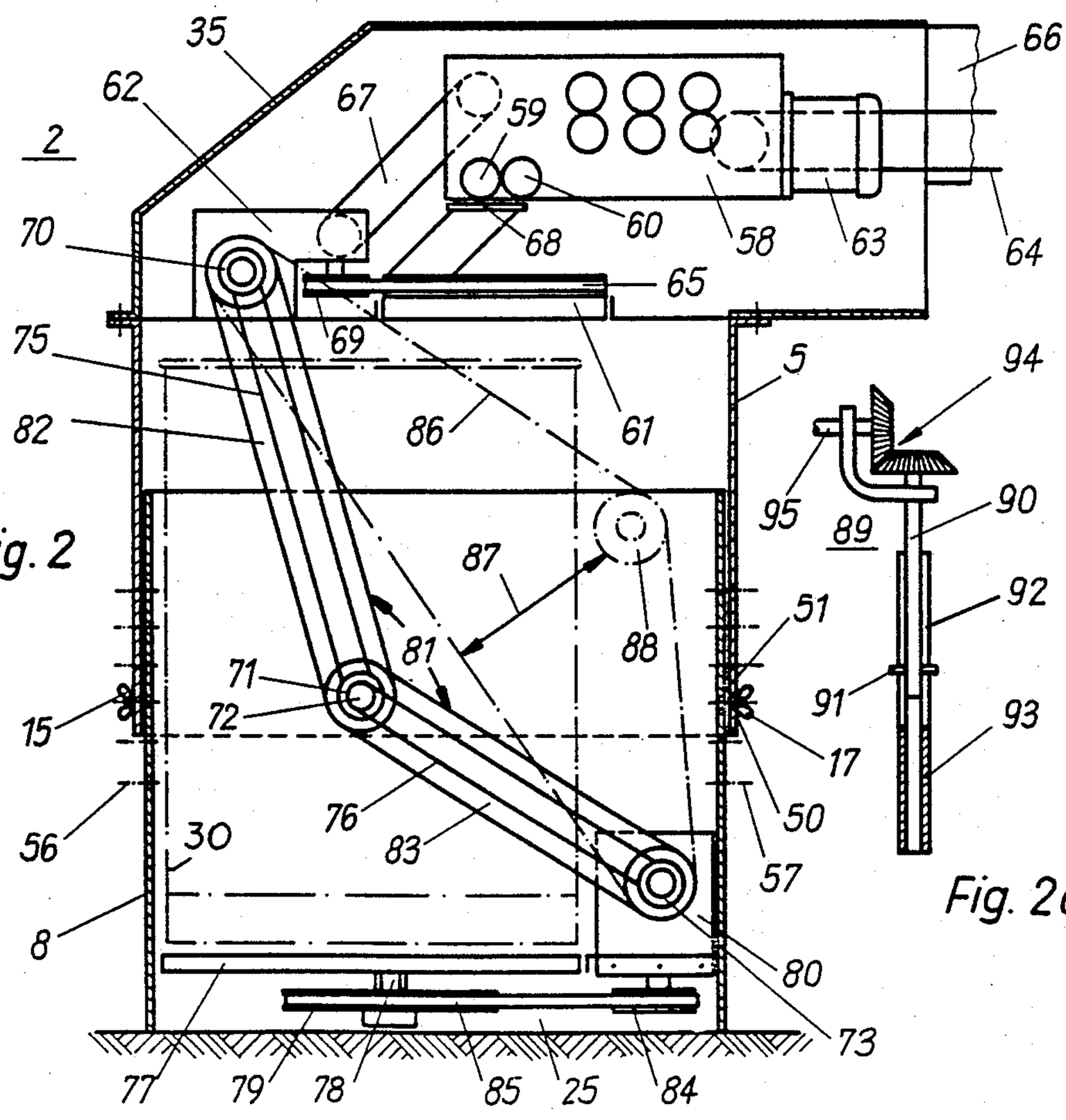


Fig. 2

Fig. 2a

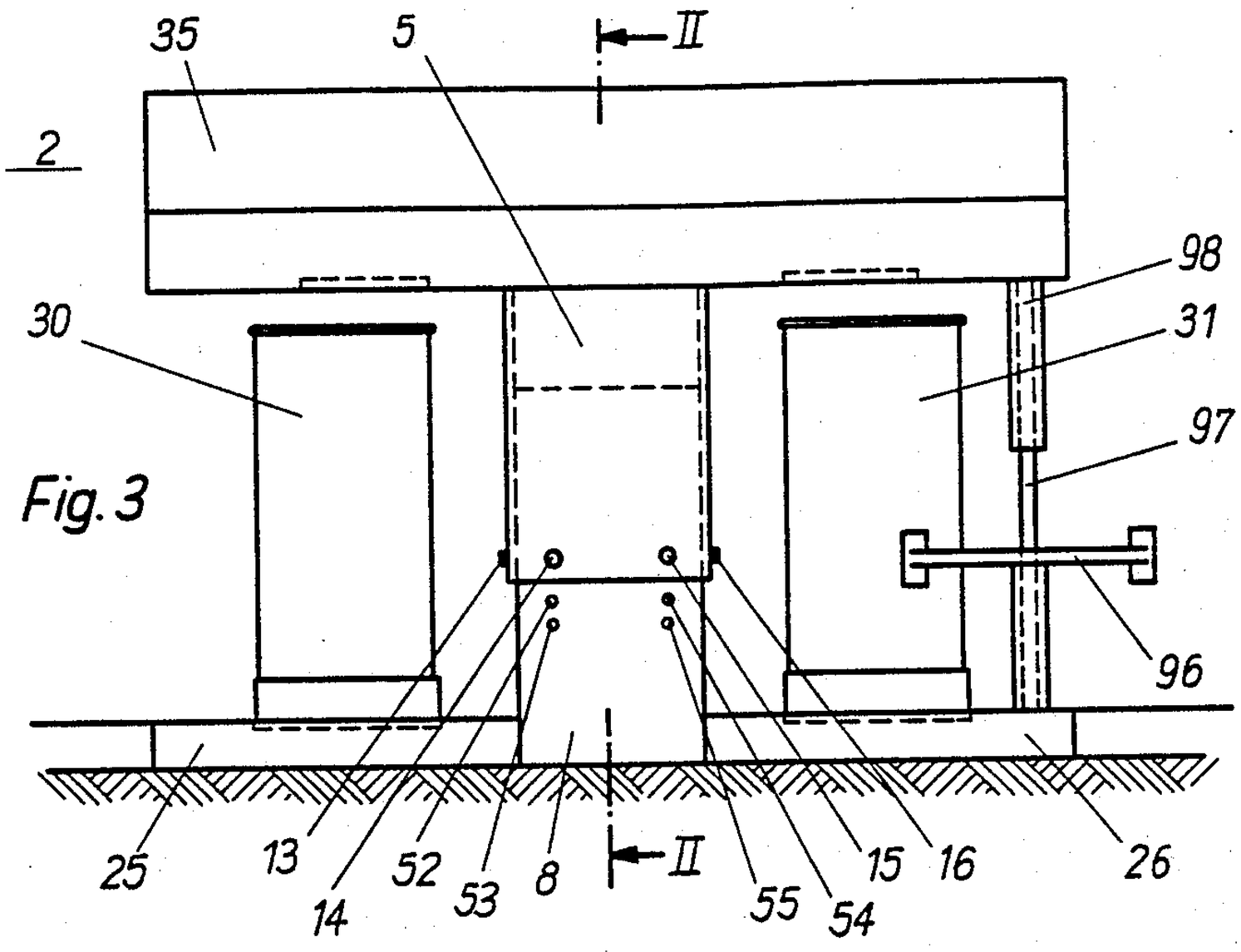

35
5
II
2
98
30
31
97
96
25
13
14
52
53
8
II
55
54
15
16
26

Fig. 3

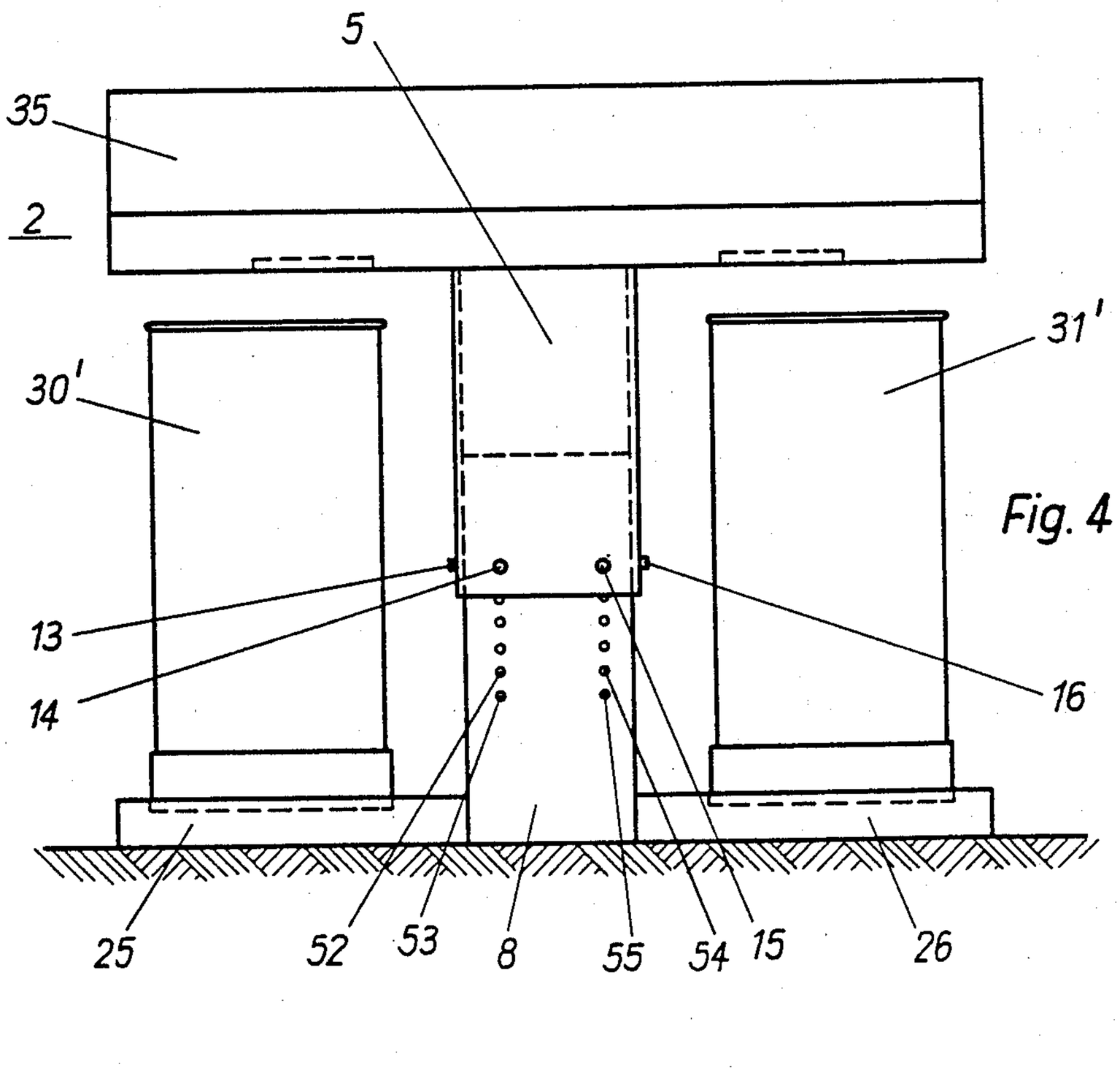

5
35
2
30'
31'
13
14
16
25
52
53
8
55
54
15
26

Fig. 4

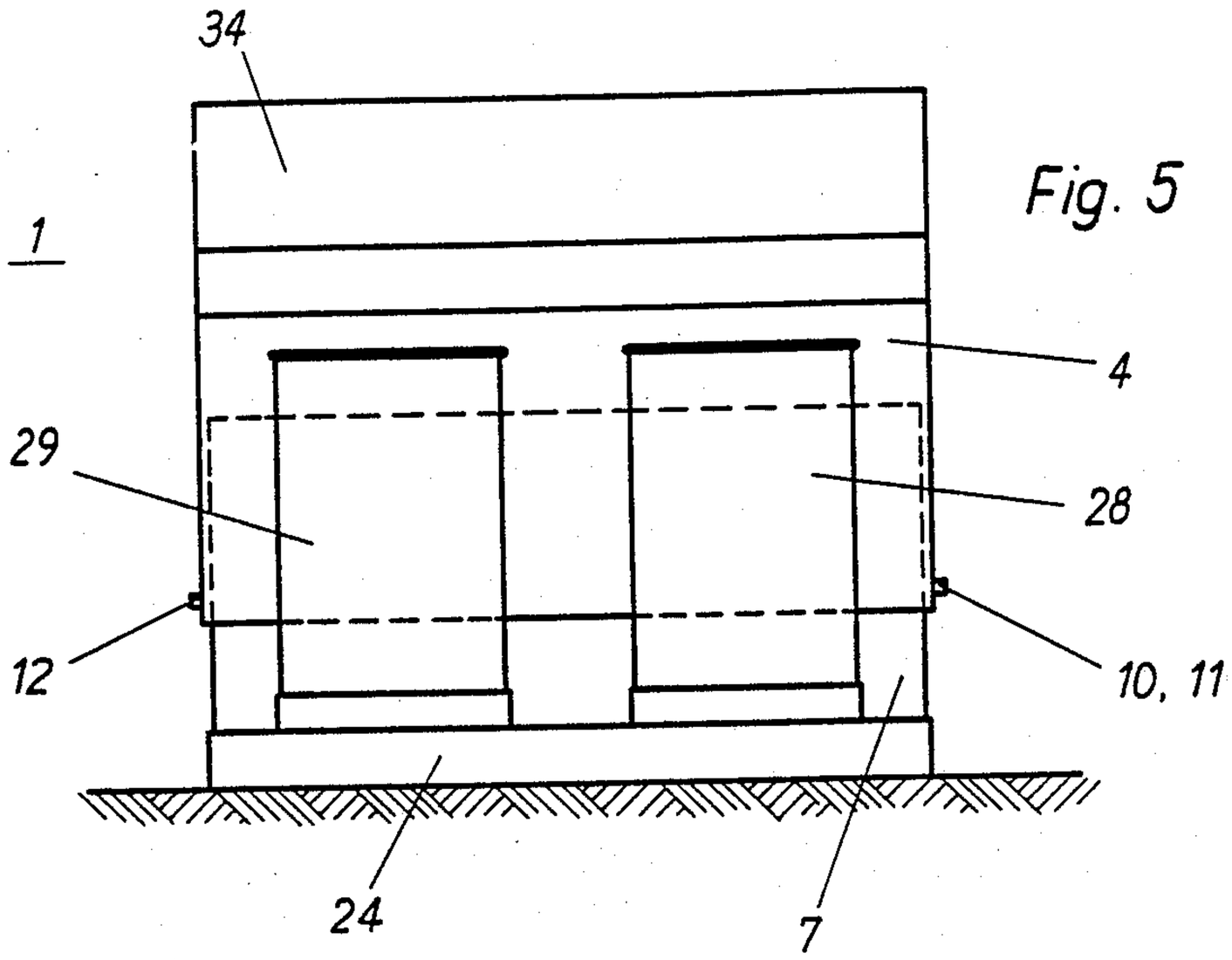


Fig. 5

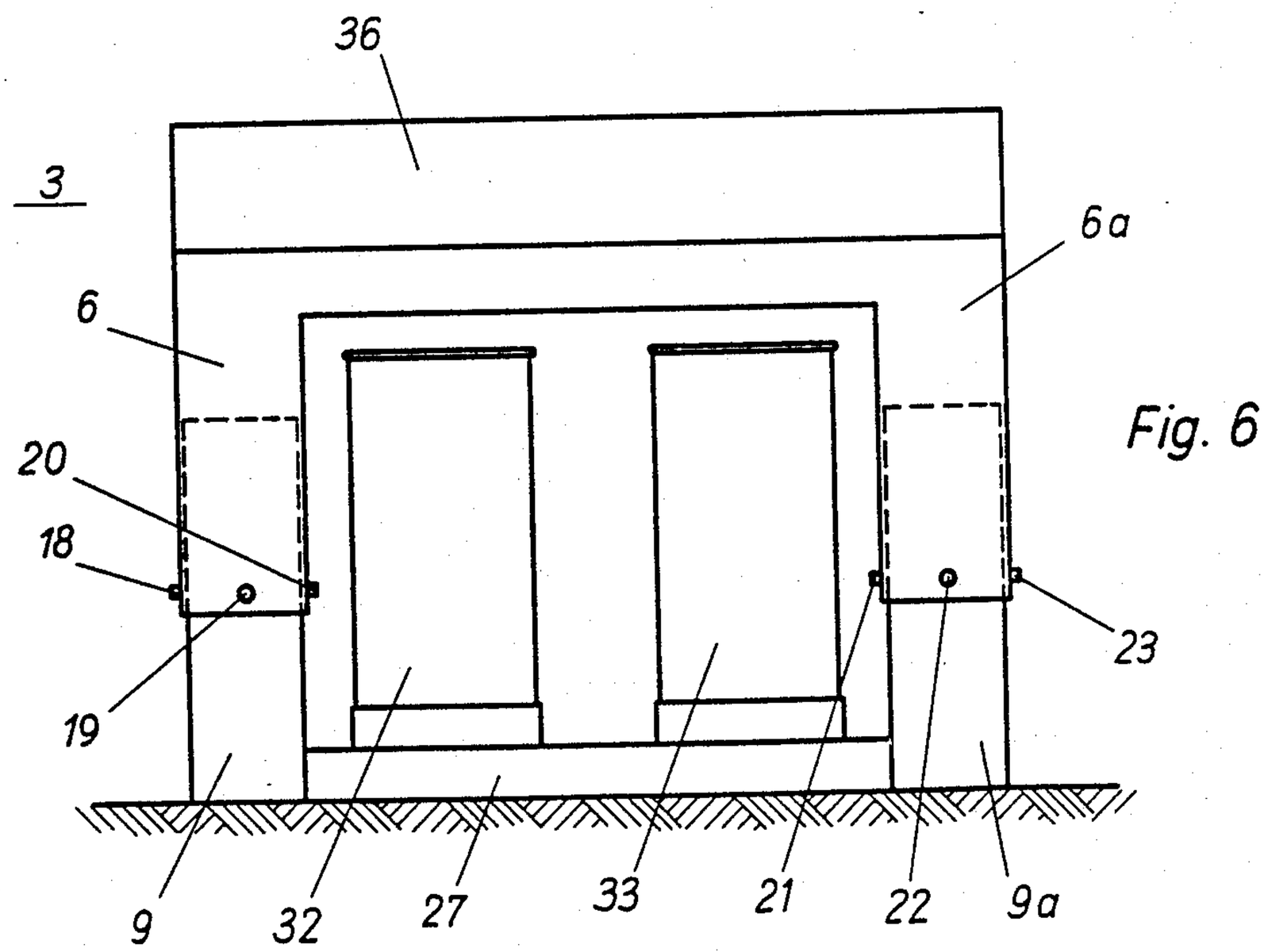


Fig. 6

VERTICALLY ADJUSTABLE DRAWING FRAME

FIELD OF THE INVENTION

The present invention relates to a drawing frame. More particularly this invention concerns such a frame usable with sliver containers of different heights.

BACKGROUND OF THE INVENTION

A drawing frame typically has an intake device for drawing in, stretching, calendaring, and/or otherwise treating one or more slivers. The treated slivers are deposited, typically by a coiler, in a can or container that sits underneath the intake device and that is rotated on a turntable about a vertical axis.

Such machines operate at very high speed so that the intake device must be closely juxtaposed with the top of the can into which the treated sliver is deposited. This problem is complicated by the fact that these cans come in several different sizes.

Accordingly it is standard to make the housings of such frames vertically separable so that different spacers can be inserted between the upper and lower parts to accommodate cans of different heights. This solution is cumbersome in practice and requires that a large stock of expensive spacers be manufactured and kept, adaptation of a drawing frame to another can height being very difficult.

OBJECTS OF THE INVENTION

It is therefore an object of the present invention to provide an improved drawing frame.

Another object is the provision of such a drawing frame which overcomes the above-given disadvantages, that is which is relatively easily vertically adjustable.

SUMMARY OF THE INVENTION

A drawing frame according to the invention has a housing having an upper part and a lower part telescoping therewith, attachments for securing the parts together at any of a plurality of different vertically offset positions, a turntable in the lower part for supporting a sliver can and for rotating it about an upright axis, and an intake device in the upper part for pulling in and drawing slivers and for depositing the drawn slivers in the can.

Thus with the system of this invention no extra parts are needed to reset the machine for cans of different height. All that is necessary is to release the attachments, move the two parts into the desired position, and reset them.

According to another feature of this invention one of the parts is at least partially within the other part and the one part is formed with a plurality of vertically offset holes. The attachments are bolts engagable through the other part with the holes of the one part. These attachment bolts can simply snap in place, or can actually be screwed into threaded holes in the inner part.

In accordance with another feature of the invention the upper part houses a drive motor and the frame further has a vertically extensible and contractile transmission coupling the drive motor to the turntable for driving same. This transmission can be a knee-type belt transmission, or a transmission having an upper shaft connected to the drive motor and a lower shaft vertically telescoping with but rotationally connected to the upper shaft and connected to the turntable. It is also within the scope of the invention for the transmission to be a belt transmission having upper and lower pulleys, a belt spanning the pulleys, and a tightening roller maintaining the belt taut.

DESCRIPTION OF THE DRAWING

The above and other objects, features, and advantages will become more apparent from the following, reference being made to the accompanying drawing in which:

FIG. **1** is a side view of a C-shaped drawing frame according to the invention;

FIG. **2***a* is a view of a detail of a variant on the structure of FIG. **2**;

FIG. **2** is a large-scale vertical longitudinal section through a portion of a T-shaped frame according to the present invention;

FIG. **3** is a front view of the T-frame of FIG. **2**, line II—II indicating the section plane of FIG. **2**;

FIG. **4** is a view like FIG. **3** but showing the T-frame set up for taller cans;

FIG. **5** is a front view taken in the direction of arrow V of the C-frame of FIG. **1**; and

FIG. **6** is a view like FIG. **5** of a portal-type frame according to the present invention.

SPECIFIC DESCRIPTION

As seen in FIGS. **1** and **5** a C-shaped drawing frame **1** has a base part **7** sitting on the floor F and, vertically displaceable relative thereto, an upper part **4** supporting at its front end a housing **34** and at its rear end an outrigger arm **37**. The upper and lower parts **4** and **7** are of identical rectangular shape but the lower part **7** is slightly smaller than the upper part so it can telescope vertically therein. The two parts are held together at attachments **10**, **11**, and **12** which as will be described below allow the two parts **4** and **7** to be vertically adjusted and fixed at any of a plurality of different vertical positions relative to each other.

A pair of output cans **28** and **29** centered on and rotatable about vertical axes are supported on a forward support part **24** of the base **7**. The height of these cans **28** and **29** determines the vertical spacing set between this foot part **24** and the upper housing **34**.

Each side of the outrigger **37** carries four longitudinally spaced intake rollers **38**, **39**, **40** and **41** associated with respective cans **42** of roving **46**, **47**, **48**, and **49** or the like to be drawn and combined. Thus four slivers are twisted, calendared, and/or spun together and coiled up in each of the cans **28** and **29**.

FIGS. **2**, **3**, and **4** show another such drawing frame **2** of T-shape having a central pedestal with an upper part **5** and a lower part **8** comparable to the parts **4** and **7** of the frame **1** of FIGS. **1** and **5**. Bolts **13**, **14**, **15**, and **16** and/or wing bolts **17** (FIG. **2**) fit through holes **50** in the upper part **5** and are threaded in holes **51–55** arranged at six different levels indicated at **56** and **57** in FIG. **2**. Thus this frame **2** is also vertically adjustable so that it can take medium-height cans **30** and **31** as seen in FIG. **3** or tall cans **30'** and **31'** as shown in FIG. **4**. Regardless of height, these cans **30**, **31**, **30'**, and **31'** sit on foot extensions **25** and **26** of the lower part **8**.

As shown in detail of FIG. **2** a single drive motor **63** is provided for the entire frame **2**, it being mounted in an upper housing **35** carried on the top part **5** between the cans **30** and **31**, the former of whose outline is shown in dot-dash lines in FIG. **2**. This motor **63** directly powers

two three-pair sets of stretching rollers **58** and two pairs of somewhat lower calendaring rollers **59** and **60**, all provided on the respective sides of the upper part **35**. In addition a belt **67** connects the motor **63** to a right-angle drive **62** in this part which itself has a pair of vertical-axis pulleys **69** connected by belts **65** to coilers **61** for the drawn and calendared slivers.

Each extension **25** and **26** has a turntable **77** carried for rotation about a vertical axis on a bearing **78** and in turn having a pulley **79** connected by a belt **85** to another pulley **84** carried on a right-angle drive **80** in the lower part **8**, it being understood that this drive **80** has two such lower output pulleys **84**, one for each turntable **77**. The cans **30** and **30** (or **30'** and **31'**) sit on the turntables **77** in the extensions **25** and **26** and can be rotated by these turntables **77** about their central vertical axes.

The upper right-angle drive **62** that is fixed in the upper part **5** is connected to the lower right-angle drive **80** fixed in the lower part **8** by a knee-type belt transmission or coupling indicated generally at **81**. This coupling **81** is formed by an upper link **82** having an upper end pivoted on the drive **62** a the horizontal rotation axis of its output pulley **70** and a lower end pivoted at the end of a double pulley **71**, **72** on the upper end of a lower link **83** having a lower end pivoted on the lower drive **80** at the horizontal rotation axis of its input pulley **73**. A belt **75** is spanned between the upper pulley **70** and one part **71** of the middle pulley **71**, **72** and another belt **76** is spanned between the other part **72** of this middle pulley **71**, **72** and the lower pulley **73**. The ability of this linkage **81** to flex and straighten allows height adjustments to be made without having to worry about the drive for the lower turntables **77**.

It is also possible as shown in FIG. **2** in dot-dash lines to provide a single belt **86** spanned between the pulleys **70** and **73** and to keep it taut with a tightening pulley **88** movable transversely of the belt **86** as shown by double-headed arrow **87**. As the upper and lower parts **5** and **8** move apart the tightening sheave **88** will move toward the opposite stretch of the belt **86** and vice versa.

FIG. **2***a* also shows a linkage **89** comprised of a tube shaft **93** which can be coaxial with and fixed to the pulley **84** of the drive **80** and which is formed with a slot **92**. A solid core shaft **90** telescopes with this shaft **93** but is linked thereto by a diametral pin **91** engaged in the slot **92**. A bevel-gear coupling **94** can connect to a shaft **95** replacing the upper pulley **70**. Thus as the upper part **5** moves up and down relative to the lower part **8** the two shafts **90** and **93** will telescope while remaining rotationally linked.

FIG. **3** also shows an automatic can-changing device comprised of a changing arm **96** carried on an upright shaft **97** fixed on the base extension **26** and vertically slidable in a guide **98** of the upper housing **35**.

FIG. **6** shows a portal-type drawing frame **3** having an overhead housing **36** supported on two pedestals, one formed by an upper part **6** and a lower part **9** and the other by an upper part **6***a* and a lower part **9***a*. The parts **6** and **9** are secured together by attachments **18**, **19**, and **20** and the parts **6***a* and **9***a* by attachments **21**, **22**, and **23**. Two cans **32** and **33** sit on a base **27** between the lower parts **9** and **9***a* and underneath the upper housing **36**.

Thus with the system of this invention it is not necessary for the plant to stock a whole series of different housing spacers. Instead all that need be done when changing over from one size to another of output can is release the attachment bolts, reset the height to the desired one, and reset these bolts.

I claim:

1. A drawing frame for depositing filaments in a can, the frame comprising:

a housing having an upper part and a generally stationary lower part telescoping therewith, one of the parts fitting complementarily within the other part;

attachment means for securing the parts together at any of a plurality of different vertically offset positions, whereby the upper part can be set at different heights above the lower part and therefore cans of different heights can be held between the parts;

means in the lower part including a turntable for supporting a filament can and for rotating it about an upright axis; and

means in the upper part for pulling in and drawing filaments and for depositing the drawn filaments in the can.

2. The drawing frame defined in claim **1** wherein one of the parts is formed with a plurality of vertically offset holes, the attachment means including bolts engageable through the other part with the holes of the one part.

3. The drawing frame defined in claim **1** wherein the means in the upper part includes a drive motor, the frame further comprising

a vertically extensible and contractile transmission coupling the drive motor to the turntable for driving same.

4. The drawing frame defined in claim **3** wherein the transmission is a knee-type belt transmission.

5. The drawing frame defined in claim **3** wherein the transmission has an upper shaft connected to the drive motor and a lower shaft vertically telescoping with but rotationally connected to the upper shaft and connected to the turntable.

6. The drawing frame defined in claim **3** wherein the transmission is a belt transmission having upper and lower pulleys, a belt spanning the pulleys, and a tightening roller maintaining the belt taut.

7. A drawing frame for depositing filaments in a can, the frame comprising:

a housing having an upper part and a generally stationary lower part telescoping therewith, one of the parts fitting complementarily within the other part;

attachment means for securing the parts together at any of a plurality of different vertically offset positions, whereby the upper part can be set at different heights above the lower part and therefore cans of different heights can be held between the parts;

a drive motor fixed in the upper part;

means in the lower part including a turntable for supporting a filament can for rotation about an upright axis;

means including a transmission having an upper end connected to the drive motor and a lower end connected to the turntable and vertically displaceable relative to the lower part for rotating the turntable about the axis; and

means in the upper part powered by the drive motor for pulling in and drawing filaments and for depositing the drawn filaments in the can.

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